

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) **14 DECEMBER 2004 (14.12.2004)**

Applicant's or agent's file reference

224

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/KR2004/002174

International filing date (day/month/year)

30 AUGUST 2004 (30.08.2004)

Priority date(day/month/year)

20 SEPTEMBER 2003 (20.09.2003)

International Patent Classification (IPC) or both national classification and IPC

IPC7 B01J 29/04

Applicant

KOREA RESEARCH INSTITUTE OF CHEMICAL TECHNOLOGY et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2004/002174

Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2004/002174

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|--------|-----|
| Novelty (N) | Claims | 1 - 17 | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | 7 - 17 | YES |
| | Claims | 1 - 6 | NO |
| Industrial applicability (IA) | Claims | 1 - 17 | YES |
| | Claims | | NO |

2. Citations and explanations :

The following documents have been considered for the purpose of this opinion.

D1 : JP 57-007432 A

D2 : JP 61-017528 A

The present invention relates to a catalyst for dimethyl ether synthesis comprising a) hydrophobic zeolite, b) a cation selected from a group consisting of alkali metal, alkaline earth metal, and ammonium ion and c) inorganic binders such as alumina, silica, etc., and a method of manufacturing the same. The catalyst manufactured by said method shows high activity without the hydrocarbon byproduct formation.

D1 relates to a method of manufacturing ether having primary or secondary alkyl group by using zeolite including a cation selected from a group consisting of alkali metal and alkaline earth metal.

D2 relates to a method of manufacturing dimethyl ether by dehydrating methanol in the presence of an alumina catalyst.

I. Novelty and Inventive Step

1. The subject matter of claims 1 ~ 17 can be regarded as novel under PCT Article 33(2), since D1 and D2 do not disclose a catalyst for manufacturing ether including hydrophobic zeolite, a cation such as alkali metal, etc., and inorganic binders, and a method of manufacturing the same.

2. The subject matter of claim 1 directed to a catalyst for dimethyl ether synthesis including hydrophobic zeolite, a cation such as alkali metal, alkaline earth metal, etc., and inorganic binders such as alumina and silica, can be easily derived from the catalyst for manufacturing ether consisting of zeolite including a cation selected among alkali metal, alkaline earth metal, etc. of D1 and the catalyst of manufacturing dimethyl ether including alumina of D2.

Claims 2-6 define the ratio of silica to alumina in said catalyst, the amount ratio of a cation as alkali metal and binders, and a type of the catalyst, which can be also easily derived from the process of manufacturing the catalyst by the skilled person to work the method taught by prior arts including D1 and D2.

Thus, the subject matter of claims 1 and 4 does neither involve an inventive step, nor satisfy the criterion set forth in PCT Article 33(3).

II. Industrial Applicability

There is no reason for forming a negative opinion about the industrial applicability of this invention.